

Formula Sheet

Area, Surface Area and Volume Eqao Sheet

Optimized Formulas

Cube

Surface Area = $6s^2$

Volume = s^3

$$A_{\text{poly}} = \frac{P \cdot a}{2}$$

Cylinder Optimized

Surface Area = $2(3.14)r^2 + 2(3.14)rh_{\text{total}}$

Volume = $2(3.14)r^2h$

$$= 6\pi r^2$$

$$2\pi r^3$$

$A = l \times w$ rectangle

$A = s^2$ square

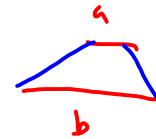
$A_{\text{cir}} = \pi r^2$

Circumference = πd ($2\pi r$)

$A_{\text{par}} = b \times h$

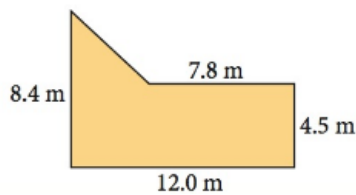
$A_{\text{tri}} = \frac{b \times h}{2}$

$A_{\text{trap}} = \frac{(a+b)h}{2}$



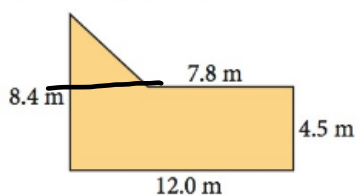
Feb 28-7:33 AM

1. Determine the area of this backyard, to the nearest square metre.



Feb 16-7:45 AM

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$$A = lw$$

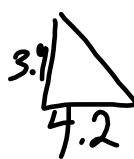
$$4.5 \times 12$$

$$54$$

$$A = \Delta + \square$$

$$A = 8.19 + 54$$

$$A = 62.19 \text{ m}^2$$



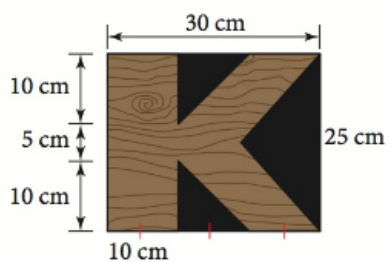
$$\frac{b \times h}{2}$$

$$\frac{(3.9)(4.2)}{2}$$

$$= 8.19$$

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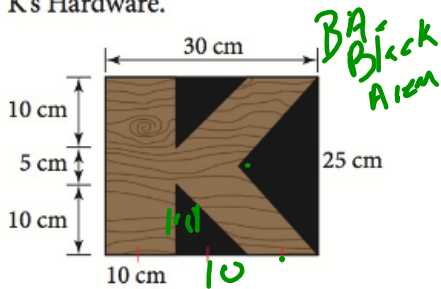
2. Kaye is constructing a sign for her store, K's Hardware.



What is the area of the sign, once the black parts are removed?

Feb 16-7:46 AM

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What is the area of the sign, once the black parts are removed?

$$A = \frac{b \times h}{2}$$
$$A = \frac{11 \times 25}{2}$$
$$A = 137.5$$

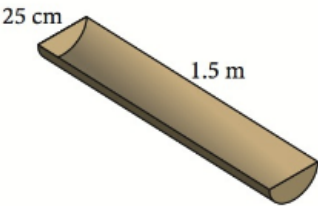
$$A = l \times w$$
$$A = 30 \times 25$$
$$A = 750$$
$$A = \frac{b \times h}{2}$$
$$A = \frac{10 \times 10}{2}$$
$$A = 50$$
$$A = 750 - 50 = 700$$

$$A = \frac{b \times h}{2}$$
$$A = \frac{10 \times 10}{2}$$
$$A = 50$$
$$100 + 137.5 = 237.5$$

The total area of the sign is 237.5 cm².

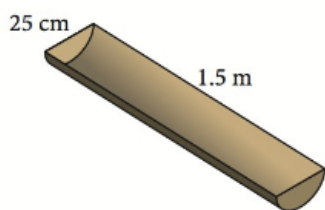
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5. Determine the volume of this trough, to two decimal places.



Feb 16-7:46 AM

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$$1.5 \text{ m} = 150 \text{ cm}$$

$$\pi r^2$$

$$\pi (125)^2$$

$$\pi 15625$$

$$A = 490.87$$

$$V = \frac{B \times h}{2}$$

$$490.87 \times 150$$

$$= 73630.5$$

$$2$$

$$V = 36815.25 \text{ cm}^3$$

Feb 16-7:46 AM

1.2 Volume, pages 18–25

4. A box in the shape of a square-based prism has a volume of 2000 cm^3 and a height of 15 cm. Determine the side length of the square base, to the nearest tenth of a centimetre.

Feb 16-7:46 AM

1.2 Volume, pages 18–25

4. A box in the shape of a square-based prism has a volume of 2000 cm^3 and a height of 15 cm. Determine the side length of the square base, to the nearest tenth of a centimetre.

$$V = T_B \times h$$

$$2000 = (s^2) \times 15$$

$$\frac{2000}{15} = s^2$$

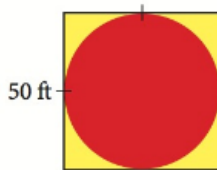
$$133.3 = s^2$$

$$11.5 = s$$

$$11.5 \text{ cm}$$

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3. This helicopter landing area is to be repainted. Each colour requires two coats of paint.

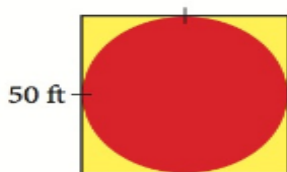


Each can of paint will cover 35 m^2 .

- How many cans of red paint are required?
- How many cans of yellow paint are required?

Feb 16-7:47 AM

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$$0.3094\text{m} = 1\text{ft}$$

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- How many cans of red paint are required?
- How many cans of yellow paint are required?

Feb 16-7:47 AM

1.3 Surface Area, pages 26–35

7. A cylindrical storage building has a height of 11 m and a diameter of 13 m. Determine the surface area, not including the bottom.

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10. A camp counsellor is fencing off a rectangular play area for the younger campers.
- a) If she has 16 m of fencing, how should she arrange the fencing to provide the greatest possible play area?
 - b) How should she alter her design if she can use the dining hall as one of her boundaries?

Feb 16-7:48 AM

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Feb 16-7:48 AM

1.6 Analyse Optimum Volume and Surface Area, pages 54–63

15. A tissue box, in the shape of a square-based prism, is to have a volume of 2500 cm^3 .

- a)** Determine the dimensions of the tissue box with minimum surface area. Discuss any assumptions you made.
- b)** Suggest two reasons why the manufacturer may not choose this box design.

Feb 16-7:48 AM

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Feb 16-7:48 AM

16. a) What are the dimensions of a cylindrical jar with surface area 1200 cm^2 and the greatest volume?
- b) Sketch the jar and label its dimensions.
- c) What is the maximum volume of this cylinder?



Feb 16-7:48 AM

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Feb 16-7:48 AM

Feb 16-1:27 PM